



DISTRIBUTION STATEMENT A
Approved for Public Release
Distribution Unlimited

**NO FURTHER ACTION DECISION UNDER
CERCLA**

**STUDY AREA 43K
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

CONTRACT DAAA15-91-D-0008

**U.S. ARMY ENVIRONMENTAL CENTER
ABERDEEN PROVING GROUND, MARYLAND**

JANUARY 1995

PRINTED ON RECYCLED PAPER

20070502721



**U.S. Army
Environmental
Center**

DISTRIBUTION STATEMENT A
Approved for Public Release
Distribution Unlimited

**NO FURTHER ACTION DECISION UNDER
CERCLA**

**STUDY AREA 43K
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

CONTRACT DAAA15-91-D-0008

**U.S. ARMY ENVIRONMENTAL CENTER
ABERDEEN PROVING GROUND, MARYLAND**

JANUARY 1995

PRINTED ON RECYCLED PAPER

20070502721

**NO FURTHER ACTION DECISION UNDER CERCLA
STUDY AREA 43K
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

Prepared for:

U.S. Army Environmental Center
Aberdeen Proving Ground, Maryland
Contract DAAA15-91-0008

Prepared by:

ABB Environmental Services, Inc.
Portland, Maine
Project No. 7053-12

JANUARY 1995

**NO FURTHER ACTION DECISION UNDER CERCLA
STUDY AREA 43K
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page No.</u>
EXECUTIVE SUMMARY		ES-1
1.0	INTRODUCTION	1-1
2.0	BACKGROUND AND PHYSICAL SETTING	2-1
2.1	DESCRIPTION AND LAND USE	2-1
2.2	REGIONAL GEOLOGY	2-2
2.3	REGIONAL HYDROGEOLOGY	2-2
2.4	STUDY AREA DESCRIPTION AND HISTORY	2-3
3.0	RELATED INVESTIGATIONS	3-1
3.1	MASTER ENVIRONMENTAL PLAN	3-1
3.2	ENHANCED PRELIMINARY ASSESSMENT	3-1
3.3	SITE INVESTIGATION REPORT	3-2
4.0	CONTAMINATION ASSESSMENT	4-1
4.1	SOILS	4-1
4.2	GROUNDWATER	4-2
5.0	PRELIMINARY HUMAN HEALTH RISK EVALUATION	5-1
6.0	PRELIMINARY ECOLOGICAL RISK EVALUATION	6-1
7.0	CONCLUSIONS	7-1
8.0	DECISION	8-1

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

REFERENCES

ABB Environmental Services, Inc.

**NO FURTHER ACTION DECISION UNDER CERCLA
STUDY AREA 43K
HISTORIC GAS STATION SITES
FORT DEVENS, MASSACHUSETTS**

LIST OF FIGURES

<u>Figure</u>	<u>Title</u>
2-1	Location of Fort Devens
2-2	Location of SA 43K
3-1	TerraProbe Locations
4-1	ATEC Field Screening Locations
4-2	Field Screening Results Depth at 6 to 9 Feet
4-3	Analytes in Soil

ABB Environmental Services, Inc.

EXECUTIVE SUMMARY

Investigations of Study Area 43K (Historic Gas Station Site) at Fort Devens, Massachusetts have resulted in the decision that no further hazardous waste studies or remediation are required at this site. Study Area 43K was identified in the Federal Facilities Agreement between the U.S. Environmental Protection Agency and the U.S. Department of Defense as a potential site of contamination.

Fort Devens was placed on the National Priorities List under the Comprehensive Environmental Response, Compensation and Liability Act as amended by the Superfund Amendments and Reauthorization Act on December 21, 1989. In addition, under Public Law 101-510, the Defense Base Realignment and Closure Act of 1990, Fort Devens was selected for cessation of operations and closure. In accordance with these acts, numerous studies, including a Master Environmental Plan, an Enhanced Preliminary Assessment, and a Site Investigation, have been conducted which address Study Area 43K.

Field investigation of Study Area 43K was initiated in 1992 in conjunction with the other 12 Groups 2, 7, and Historic Gas Stations Study Areas at Fort Devens. The Study Area 43K site investigation consisted of a surficial geophysical survey, subsurface soil sampling using ABB Environmental Services, Inc.'s TerraProbe unit, field analysis of the subsurface soil samples, and one soil boring to collect samples for laboratory analysis.

The geophysical survey indicated that one abandoned underground storage tank was present at the site. This tank was removed by ATEC Environmental Consultants on September 3, 1992. ATEC performed field screening for volatile organic compounds and total petroleum hydrocarbons on eight soil samples collected from the walls of the excavation. Volatile organic compound concentrations ranged from 0.5 to 190 parts per million, and total petroleum hydrocarbon concentrations ranged from 22 to 89 parts per million. Based on these results, ATEC removed more soil from the excavation and collected four additional soil samples. Volatile organic compounds ranged from 1 to 4 parts per million in the soil headspace and total petroleum hydrocarbon concentrations (measured in the laboratory) ranged from 15 to 58 parts per million. The 58 parts per million of total petroleum hydrocarbons was found in the southeast corner of the excavation. No volatile organic compounds were detected in the one soil sample analyzed in the laboratory for volatile organic compounds. One groundwater sample was collected from the excavation and analyzed in the laboratory for total petroleum

ABB Environmental Services, Inc.

EXECUTIVE SUMMARY

hydrocarbons only. A concentration of 22 milligrams per liter of total petroleum hydrocarbons was detected in this sample. Due to these results, ATEC lined the southeast corner of the excavation with polyethylene sheeting and backfilled the entire excavation with clean fill. Based on the results of the ATEC field screening, this underground storage tank removal was classified as a successful removal and no further soil removal or remediation was conducted.

To determine whether contamination had migrated laterally along the water table, 11 soil samples were collected at ten TerraProbe points around the excavation at SA 43K. The results of the field analyses indicated that no benzene, toluene, ethylbenzene, and xylene compounds or total petroleum hydrocarbons were present in the subsurface soil samples around the excavation.

One soil boring (43K-92-01X) was drilled to the water table to confirm the field screening results. No volatile organic compounds or total petroleum hydrocarbons were detected in the soil sample collected from the water table, and lead was present below established Fort Devens background concentrations.

On the basis of findings at Study Area 43K and the Preliminary Risk Evaluation, there is no evidence or reason to conclude that petroleum contamination due to the former underground storage tank has caused significant environmental contamination or poses a threat to human health. The decision has been made to remove Study Area 43K from further consideration in the Installation Restoration Program.

1.0 INTRODUCTION

This decision document has been prepared to support a no further action decision at Study Area 43K - Historic Gas Station Site (SA 43K) at Fort Devens, Massachusetts. The report was prepared as part of the U.S. Department of Defense (DOD) Base Realignment and Closure (BRAC) program to assess the nature and extent of contamination associated with site operations at Fort Devens.

In conjunction with the Army's Installation Restoration Program (IRP), Fort Devens and the U.S. Army Environmental Center (USAEC; formerly the U.S. Army Toxic and Hazardous Materials Agency) initiated a Master Environmental Plan (MEP) in 1988. The MEP consists of assessments of the environmental status of SAs, specifies necessary investigations, and provides recommendations for response actions with the objective of identifying priorities for environmental restoration at Fort Devens. The Historic Gas Station Sites were identified in the MEP as potential areas of contamination. On December 21, 1989, Fort Devens was placed on the National Priorities List under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act.

An Enhanced Preliminary Assessment (PA) was also performed at Fort Devens to address areas not normally included in the CERCLA process, but requiring review prior to closure. A final version of the PA report was completed in April 1992. In 1992, DOD, through USAEC, also initiated a Site Investigation (SI) for SA 43A through S along with the other 12 SAs in SA Groups 2 and 7 at Fort Devens. The SI was conducted by ABB Environmental Services, Inc. (ABB-ES).

Under Public Law 101-510, the Defense Base Realignment and Closure Act of 1990, Fort Devens has been selected for cessation of operations and closure. An important aspect of BRAC actions is to determine environmental restoration requirements before property transfer can be considered. Studies at SA 43K were conducted to support this overall mission.

ABB Environmental Services, Inc.

THIS PAGE INTENTIONALLY LEFT BLANK

2.0 BACKGROUND AND PHYSICAL SETTING

2.1 DESCRIPTION AND LAND USE

Fort Devens is located approximately 35 miles northwest of Boston, Massachusetts, within Middlesex and Worcester counties. The installation consists of approximately 9,280 acres and includes portions of the towns of Ayer, Harvard, Lancaster and Shirley. Cities in the vicinity include Fitchburg, Leominster and Lowell. Land surfaces range from about 200 feet above mean sea level (MSL) along the Nashua River in the northern portion of the installation to 450 feet above MSL in the southern portion of the installation.

Fort Devens was established in 1917 as Camp Devens, a temporary training camp for soldiers from the New England area. In 1931, the camp became a permanent installation and was redesignated as Fort Devens. Throughout its history, Fort Devens has served as a training and induction center for military personnel and a unit mobilization and demobilization site. All or portions of this function occurred during World Wars I and II, the Korean and Vietnam conflicts, and operations Desert Shield and Desert Storm. The primary mission of Fort Devens is to command, train, and provide logistical support for non-divisional troop units. The installation also supports that portion of the U.S. Army Intelligence School located at Fort Devens, for the Army Readiness Region, for Reserve Components, and for Army Reserve and National Guard in the New England area.

Fort Devens currently consists of three major land use areas: Main Post, South Post, and North Post (Figure 2-1).

The majority of the facilities on Fort Devens are located in the Main Post area, north of Massachusetts Highway 2. The Nashua River intersects the Main Post along its western edge. The Main Post provides all of the on-post housing, including over 1,700 family units and 9,800 bachelor units (barracks and unaccompanied officer's quarters). Other facilities on the Main Post include community support activities (such as a shoppette, cafeteria, post exchange, commissary, bowling alley, golf course, and hospital), administrative buildings, classrooms and training facilities, maintenance facilities, and ammunition storage facilities. The Historic Gas Station Sites, including SA 43K, are located on the Main Post.

ABB Environmental Services, Inc.

SECTION 2

The South Post is located south of Massachusetts Highway 2 and contains individual training areas designated for troop training, range activities, and a drop zone. The Nashua River bounds the South Post on the northeast side.

The North Post is directly north of the Main Post. The principal activities on the North Post are the Douglas E. Moore Army Airfield, and the installation Waste Water Treatment Plant.

2.2 REGIONAL GEOLOGY

Fort Devens is near the western boundary of the Seaboard Lowland Section of the New England-Maritime Physiographic province (Jahns, 1953). It is adjacent to the Worcester County Plateau of the Central Uplands province and part of the installation lies within the province (Koteff, 1966). The land surface is almost completely covered with unconsolidated glacial outwash deposits, resulting in few bedrock outcrops. The surficial deposits are underlain by a highly complex assemblage of intensely folded and faulted metasedimentary rocks with occasional igneous intrusions. The geomorphology of the region is dominated by glacial features such as outwash plains, kames, kame terraces, drumlins, and eskers.

2.3 REGIONAL HYDROGEOLOGY

Groundwater at Fort Devens occurs largely in the permeable glacial-deltaic outwash deposits of sand, gravel, and boulders. Well yields within these sediments are dependent upon the hydraulic characteristics of the aquifer and can range from 2 to over 300 gallons per minute (gpm). Small amounts of groundwater can be obtained from fractured bedrock with yields ranging from 2 to 10 gpm. Minor amounts of groundwater may be found in thin, permeable glacial lenses elsewhere on the installation. The primary hydrogeologic feature at Fort Devens is the Nashua River, which flows through the installation in a south to north direction, with an average discharge rate of 55 cubic feet per second. In addition to the Nashua River, the terrain is dissected by numerous brooks that are associated with attendant wetlands. There are also several kettle ponds and one kettle lake located within the installation.

2.4 STUDY AREA DESCRIPTION AND HISTORY

SA 43K, one of the 19 Historic Gas Station Sites, is included in the Group 2 SAs located on the Main Post. The structures of the historic gas station at SA 43K consisted of a pump island and a small gasoline pumphouse. This gas station was a Type A station which had one 5,000 gallon underground storage tank (UST) located between the gasoline pumphouse and pump island. The station was used during World War II as a vehicle motor pool to support military operations. The motor pool operations were discontinued during the late 1940s or early 1950s. No records were available on the decommissioning of this motor pool or the removal of the associated UST. SA 43K is located on an access road off Patton Road. The area around SA 43K is currently a recreational vehicle storage yard and maintenance facility for Fort Devens Directorate of Logistics. The pumphouse associated with the historic gas station (Building T-2514) appears to still be present at the site. The yard and maintenance facility is paved and surrounded by a chain-link fence with a locked gate located on the northeast side of the yard (Figure 2-2).

THIS PAGE INTENTIONALLY LEFT BLANK

3.0 RELATED INVESTIGATIONS

3.1 MASTER ENVIRONMENTAL PLAN

SA 43, the Historic Gas Station Sites, was identified as a possible source for release of contaminants into the environment. The 19 gas stations were identified from a circa 1941 map (Barbour, 1941). The MEP recommended that the remaining USTs be located, and residual contamination in soil be removed (Biang, et al., 1992). The MEP reports that a 1,000-gallon waste oil UST was removed from SA 43K in February 1989. The tank and associated piping had no visible leaks or damage. The tank contained 300 gallons of waste oil and 28 gallons of sediment. Approximately 10 cubic yards of contaminated soil was removed, screened for volatile organic compounds (VOCs) and was disposed of at an off-site facility. VOCs were detected at 1.4 to 9.0 parts per million (ppm). A composite soil sample was collected from the bottom of the excavation was analyzed for total petroleum hydrocarbon compounds (TPHC). A confirmation sample was also collected. The composite soil sample contained 3,539 ppm TPHC and the confirmation sample contained 663 ppm TPHC. Groundwater, which was encountered at 3.5 feet and pumped during the removal, was sampled and contained 4.8 ppm TPHC. Two soil borings were drilled near the excavation in May 1989. Soil samples were collected at depths of zero to 2 feet, 5 to 7 feet, and 10 to 12 feet and analyzed for VOCs and TPHC. Samples contained TPHC at 663 ppm and VOCs at 0.6 ppm. There is no information to indicate that further soil sampling was done in this area (Biang, et al., 1992). This UST removal (No. 2517-U-1) was further investigated under the AREE 62 AX program. The results of this investigation can be found in the Draft Underground Storage Tank, "AREE 63 Supplemental EE Data Package, November 1994."

3.2 ENHANCED PRELIMINARY ASSESSMENT

The PA included a review of the study and recommendations presented in the MEP and considered other areas that might require evaluation due to the closure of Fort Devens. No additional findings or recommendations for SA 43K were provided in the PA.

SECTION 3

3.3 SITE INVESTIGATION REPORT

The SI was initiated in June 1992 and included the following 13 Group 2 and 7 SAs originally identified in the MEP:

- SA 13 Landfill No. 9
- SA 43 Historic Gas Stations (19 Sites)
- SA 45 Lake George Street Vehicle Wash Area
- SA 49 Building 3602 Leaking Underground Storage Tank (LUST) Site
- SA 56 Building 2417 LUST Site
- SA 57 Building 3713 Fuel Oil Spill
- SA 58 Buildings 2648 and 2650 Fuel Oil Spills
- SA 12 Landfill No. 8
- SA 14 Landfill No. 10
- SA 27 Waste Explosive Detonation Range (Hotel)
- SA 28 Waste Explosive Detonation Range (Training Area 14)
- SA 41 Unauthorized Dumping Area (Site A)
- SA 42 Popping Furnace

The SI was conducted by ABB-ES under contract with the USAEC. The Final Site Investigation Report was issued May 1993. The purpose of the SI was to verify the presence or absence of environmental contamination and to determine whether further investigation or remediation was warranted.

A field investigation was conducted at SA 43K to determine if any abandoned USTs were present at the site, and if any residual contamination was present in the subsurface soil. The program consisted of a surficial geophysical survey, subsurface soil sampling using ABB-ES' TerraProbe unit, field analysis of the subsurface soil samples, and one soil boring to collect subsurface soil samples for laboratory analysis.

The geophysical survey at SA 43K consisted of a metal detector and ground penetrating radar survey. The results of the geophysical survey at SA 43K indicated that one abandoned UST was present at the site (Figure 3-1). The results of the geophysical surveys are presented in Appendix L of the SI Report (ABB-ES, 1993).

Ten TerraProbe points were advanced to the water table and a single subsurface soil sample was collected from each point (see Figure 3-1). All of the subsurface soil

ABB Environmental Services, Inc.

samples collected with the TerraProbe unit were analyzed in the field for benzene, toluene, ethylbenzene, and xylenes (BTEX) and TPHC.

One soil boring (43K-92-01X) was drilled to the water table and a single soil sample was collected to confirm the field screening results. This soil sample was collected from the water table (5 feet) and was analyzed in the laboratory for VOCs, TPHC, and lead. Bedrock was not encountered in the soil boring drilled at the site.

THIS PAGE INTENTIONALLY LEFT BLANK

4.0 CONTAMINATION ASSESSMENT

The abandoned UST detected at SA 43K was added to the installation's UST removal program and on September 3, 1992 ATEC Environmental Consultants (ATEC) removed a 5,000-gallon UST from SA 43K. The tank was observed to be in good condition with no holes, perforations, or corrosion. Associated piping was intact and in good condition (ATEC, 1992). The scrap tank was disposed of at John C. Tombarello & Sons. At the time of the removal, the tank was full of gasoline and water which was removed by Cyn Oil Corporation (ATEC, 1992). The UST was half submerged in the groundwater, which was observed at approximately 7.5 feet in the excavation (ATEC, 1992). Visually contaminated soil and groundwater were observed at and above the water in the excavation.

4.1 SOILS

Subsurface soils were sampled and analyzed both on site and at an off-site laboratory during the tank removal program at SA 43K. These results are summarized in the following paragraphs.

ATEC performed field screening on eight soil samples (SS-1 through SS-8) collected from the excavation at 5 to 6 feet below ground surface (bgs) (Figure 4-1). VOC concentrations (measured by photoionization detector in soil headspace) ranged from 0.5 to 190 parts per million (ppm), and TPHC levels, measured on a Non-Dispersive Infrared (NDIR) Analyzer, were from 22.1 to 88.7 ppm (ATEC, 1992) (Table 4-1). Based on these results, ATEC removed approximately 140 tons of soil from the excavation and collected four additional soil samples (LRS-1 through LRS-4) (see Figure 4-1). VOCs ranged from 1 to 4 ppm in the soil headspace and TPHC concentrations (measured in the laboratory) ranged from 15 to 58 ppm (see Table 4-1). The 58 ppm of TPHC was found in the southeast corner of the excavation. No VOCs were detected in the one soil sample (LRS-3) analyzed in the laboratory for VOCs. Due to these results, ATEC lined the southeast corner of the excavation with polyethylene sheeting and backfilled the entire excavation with approximately 600 tons of clean fill. Based on the results of the ATEC field screening, this UST removal was classified as a successful UST removal and no further soil removal or remediation was conducted.

SECTION 4

To determine whether contamination had migrated laterally along the water table, 11 soil samples were collected at ten TerraProbe points around the excavation at SA 43K (see Figure 3-1). The results of the field analyses indicated that no BTEX or TPHC was present in the subsurface soil samples around the excavation (Table 4-2; Figure 4-2).

One soil boring (43K-92-01X) was drilled to the water table to confirm the field screening results. No VOCs or TPHC were detected in the soil sample collected from the water table, and lead was present below established Fort Devens background concentrations (Table 4-3; Figure 4-3).

4.2 GROUNDWATER

One groundwater sample (LWS-1) was collected from the excavation and analyzed in the laboratory for TPHC only (see Figure 4-1). A concentration of 22 milligrams per liter of TPHC was detected in LWS-1 (Table 4-1).

5.0 PRELIMINARY HUMAN HEALTH RISK EVALUATION

A 5,000-gallon UST was discovered by ABB-ES and removed by ATEC during the SI field program. Groundwater was encountered at 7.5 feet bgs (ATEC, 1992). Prior to backfilling, ATEC collected eight soil samples from the excavation walls which were screened for TPHC by the NDIR method. TPHC levels ranged from 22 ppm to a maximum value of 89 ppm in the tank wall samples. Laboratory results of confirmatory soil samples showed concentrations of TPHC ranging from 15 to 58 ppm. The excavation was backfilled by ATEC and ABB-ES conducted follow-up SI activity.

Field analysis of 11 TerraProbe soil samples immediately below the water table revealed no measurable concentrations of BTEX to a depth of 9 feet. TPHC was not detected above the method detection limit in any of 8 samples analyzed. A soil sample from a confirmatory boring 43K-92-01X showed no evidence of residual TPHC contamination at 5 feet bgs.

These results indicate that little residual contamination exists at SA 43K in the saturated zone from petroleum products. Comparing the measured TPHC results against the calculated risk-based commercial/industrial concentration value of 1,700 ppm for gasoline, and against the Massachusetts Contingency Plan's most conservative concentration of 500 ppm, there should be no significant risk to public health from soil contamination at SA 43K.

THIS PAGE INTENTIONALLY LEFT BLANK

6.0 PRELIMINARY ECOLOGICAL RISK EVALUATION

A preliminary ecological risk evaluation was not prepared for SA 43K because contaminants associated with a UST would be confined to subsurface soil, and would not impact any ecological receptors.

THIS PAGE INTENTIONALLY LEFT BLANK

7.0 CONCLUSIONS

The objective of the field investigation at SA 43K was to determine if the former historic gas station activities had adversely impacted the soil or groundwater quality in the area around SA 43K. Based on the results of the field and laboratory analysis conducted by ATEC and ABB-ES, it appears that the contamination detected during the UST removal at SA 43K was removed by ATEC during the remediation phase of the UST removal. No further action is recommended for this historic gas station.

THIS PAGE INTENTIONALLY LEFT BLANK

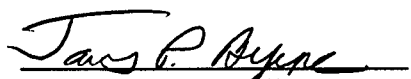
8.0 DECISION

On the basis of findings at SA 43K, there is no evidence or reason to conclude that petroleum contamination from the former UST has caused significant environmental contamination or poses a threat to human health or the environment. The decision has been made to remove SA 43K from further consideration in the IRP process. In accordance with CERCLA 120 (h) (3), all remedial actions necessary have taken place, and the USEPA and MADEP signatures constitute concurrence in accordance with the same.


JAMES C. CHAMBERS
BRAC Environmental Coordinator

18 JAN 95
Date

U.S. ENVIRONMENTAL PROTECTION AGENCY

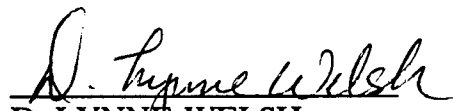

JAMES P. BYRNE
Fort Devens Remedial Project Manager

1/18/95
Date

☒ Concur

☐ Non-concur (Please provide reasons for non-concurrence in writing)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION


D. LYNNE WELSH
Section Chief, Federal Facilities - CERO

1/18/95
Date

☒ Concur

☐ Non-concur (Please provide reasons for non-concurrence in writing)

ABB Environmental Services, Inc.

THIS PAGE INTENTIONALLY LEFT BLANK

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

ABB-ES	ABB Environmental Services, Inc.
ATEC	ATEC Environmental Consultants
BRAC	Base Realignment and Closure
BTEX	benzene, toluene, ethylbenzene, and xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOD	U.S. Department of Defense
gpm	gallons per minute
IRP	Installation Restoration Program
LUST	leaking underground storage tank
MEP	Master Environmental Plan
MSL	mean sea level
NDIR	Non-Dispersive Infrared
PA	Enhanced Preliminary Assessment
ppm	part per million
SA	Study Area
SI	site investigation
TPHC	total petroleum hydrocarbons
USAEC	U.S. Army Environmental Center
UST	underground storage tank
VOC	volatile organic compound

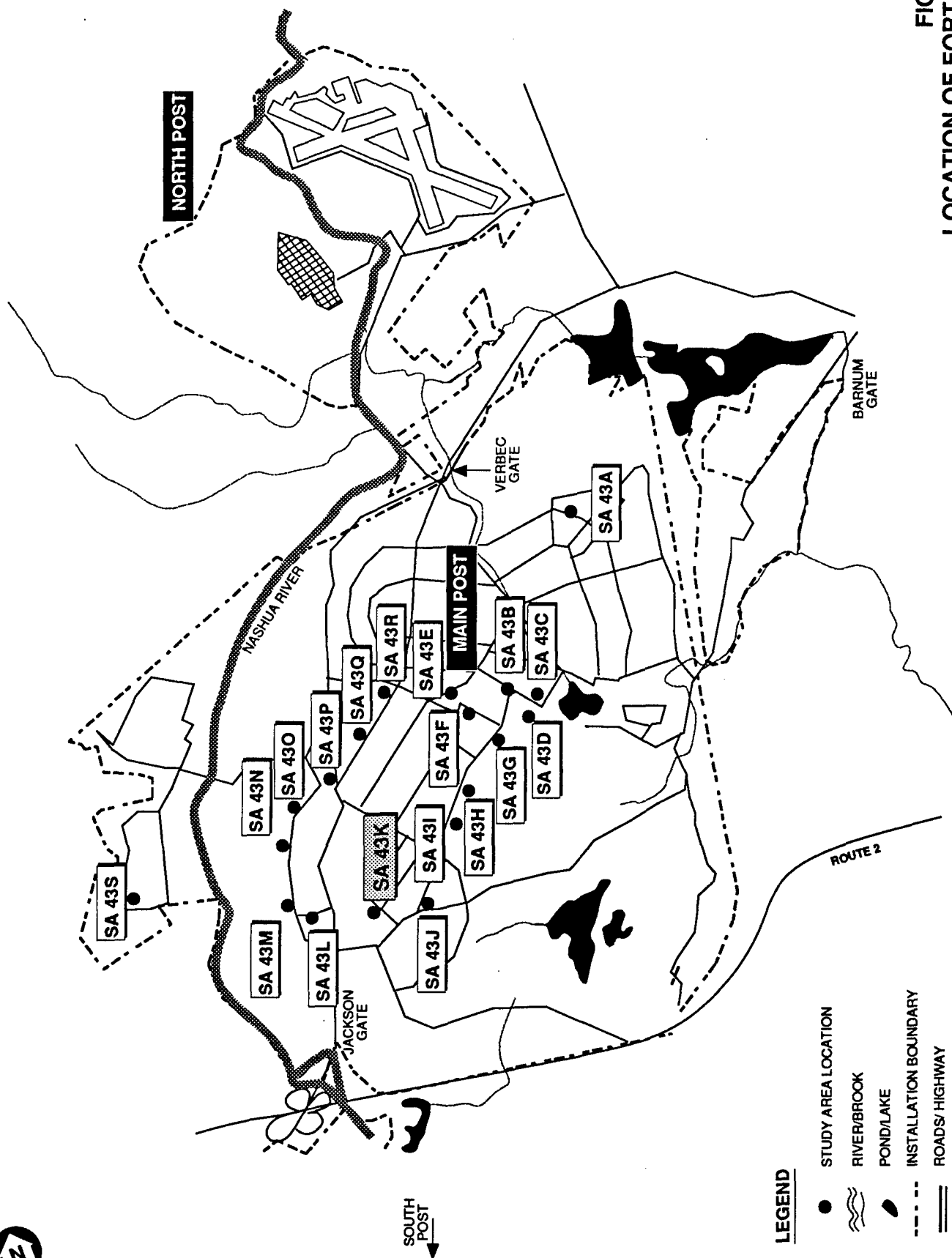
ABB Environmental Services, Inc.

THIS PAGE INTENTIONALLY LEFT BLANK

REFERENCES

- ABB Environmental Services, Inc. (ABB-ES), 1993. "Final Site Investigation Report - Groups 2, 7, and Historic Gas Stations, Fort Devens, Massachusetts"; Data Item A009; prepared for the U.S. Army Environmental Center by ABB Environmental Services, Inc., Portland, ME, May.
- ATEC Environmental Consultants, Inc. (ATEC), 1992. "Post-Removal Report, Underground Storage Tank Closure, 5,000 Gallon Gasoline, UST No. 0113, Building 2514, Fort Devens, Massachusetts"; ATEC File No. 37.07.91.07451; Norwell, MA; prepared for U.S. Army Directorate of Contracting; Fort Devens, MA; October 8.
- Barbour, F.A., c. 1941. "Fort Devens, Mass. General Layout Plan"; Plan 6101-710.1B; prepared for Construction Division, Office of Quartermaster General; Scale approximately 1:7,000.
- Biang, C.A., R.W. Peters, R.H. Pearl, and S.Y. Tsai, 1992. "Master Environmental Plan for Fort Devens, Massachusetts"; prepared for U.S. Army Toxic and Hazardous Materials Agency; prepared by Argonne National Laboratory, Environmental Assessment and Information Sciences Division; Argonne, IL; Final, April.
- Jahns, R.H., 1953. "Surficial Geology of the Ayer Quadrangle, Massachusetts"; Scale 1:31,680; U.S. Geological Survey.
- Koteff, C., 1966. "Surficial Geologic Map of the Clinton Quadrangle, Worcester County, Massachusetts;" U.S. Geological Survey Map GQ-567.

THIS PAGE INTENTIONALLY LEFT BLANK



LEGEND

- STUDY AREA LOCATION
- ~ RIVER/BROOK
- POND/LAKE
- - - INSTALLATION BOUNDARY
- == ROADS/HIGHWAY

SCALE IN FEET

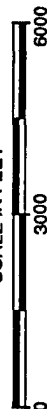


FIGURE 2-1
LOCATION OF FORT DEVENS
SA 43K DECISION DOCUMENT
FORT DEVENS, MA
ABB Environmental Services, Inc.

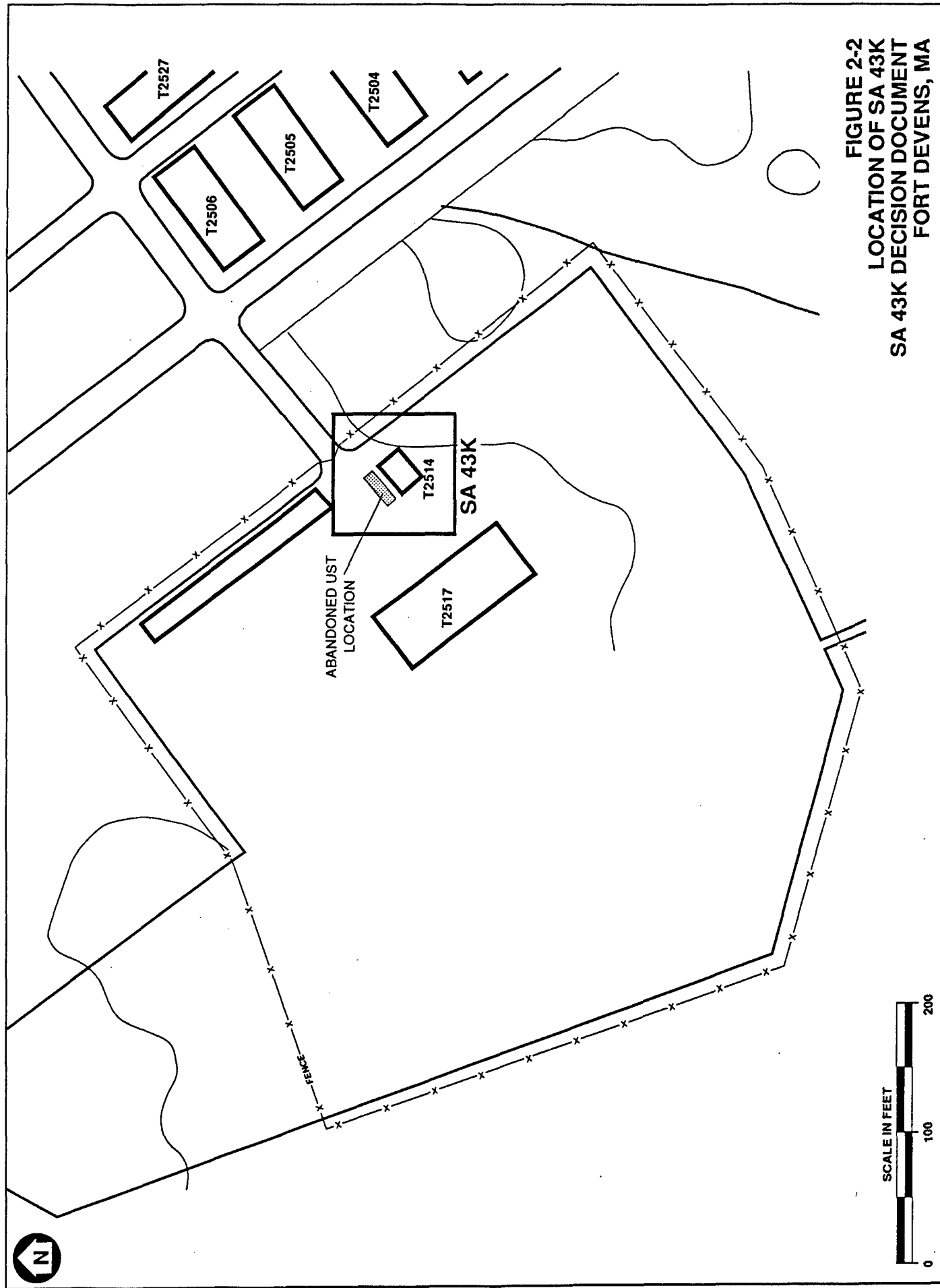
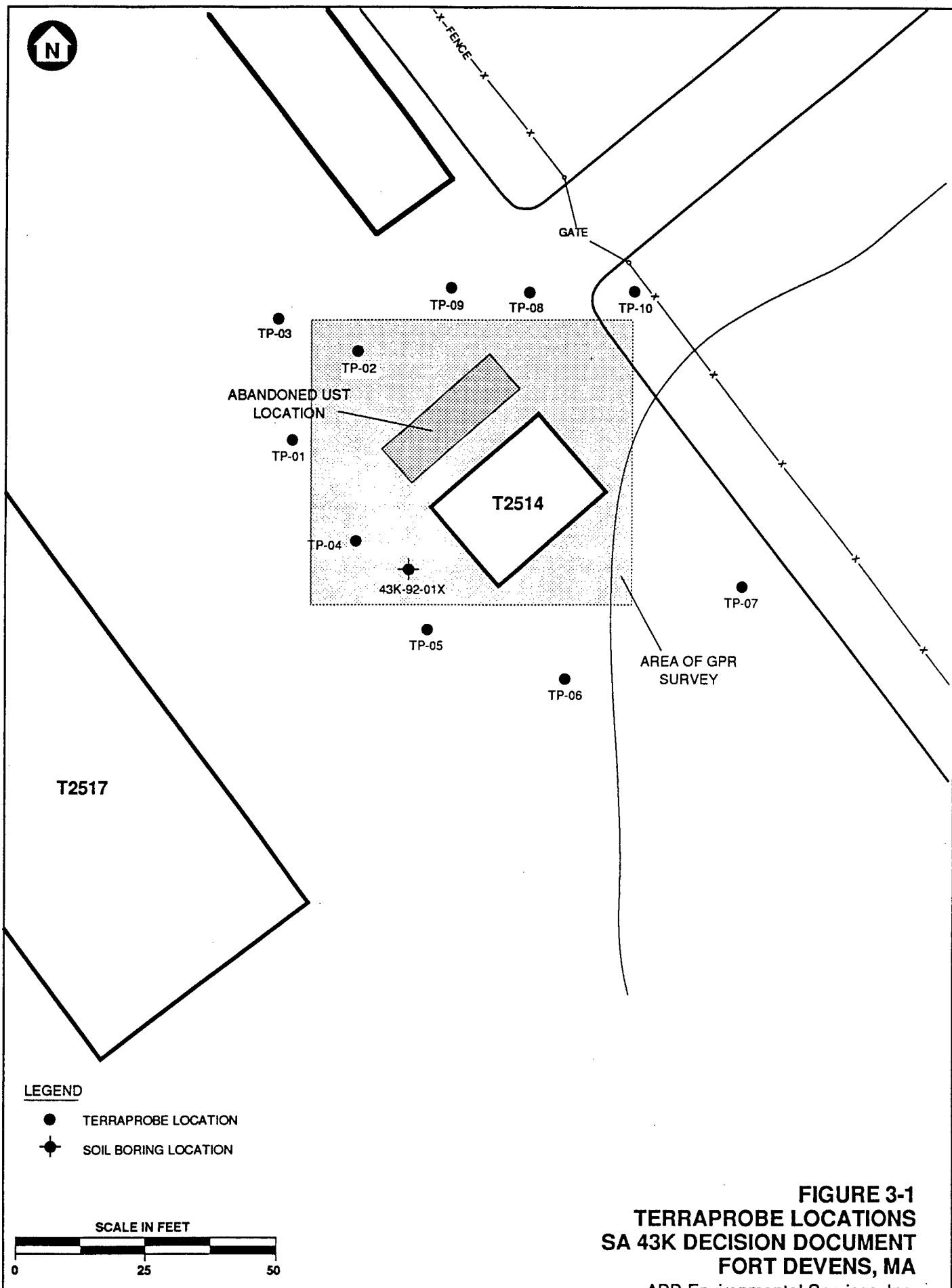
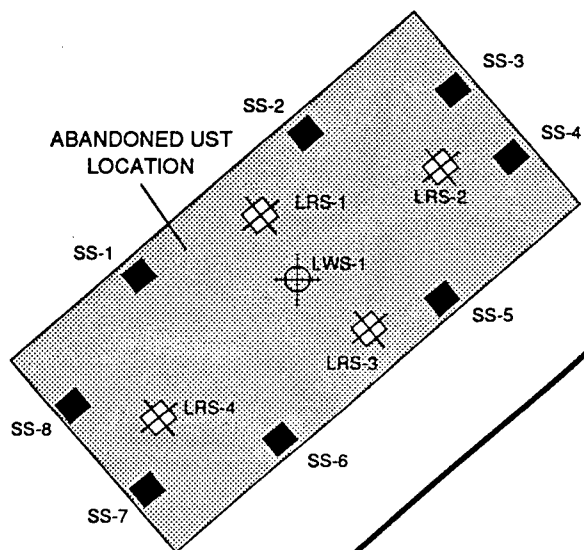


FIGURE 2-2
LOCATION OF SA 43K
SA 43K DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.





LEGEND



ATEC FIELD SCREENING LOCATIONS



ATEC LABORATORY SOIL SAMPLE LOCATION



ATEC LABORATORY WATER SAMPLE LOCATION

SCALE IN FEET



FIGURE 4-1
ATEC FIELD SCREENING LOCATIONS
SA 43K DECISION DOCUMENT
FORT DEVENS, MA

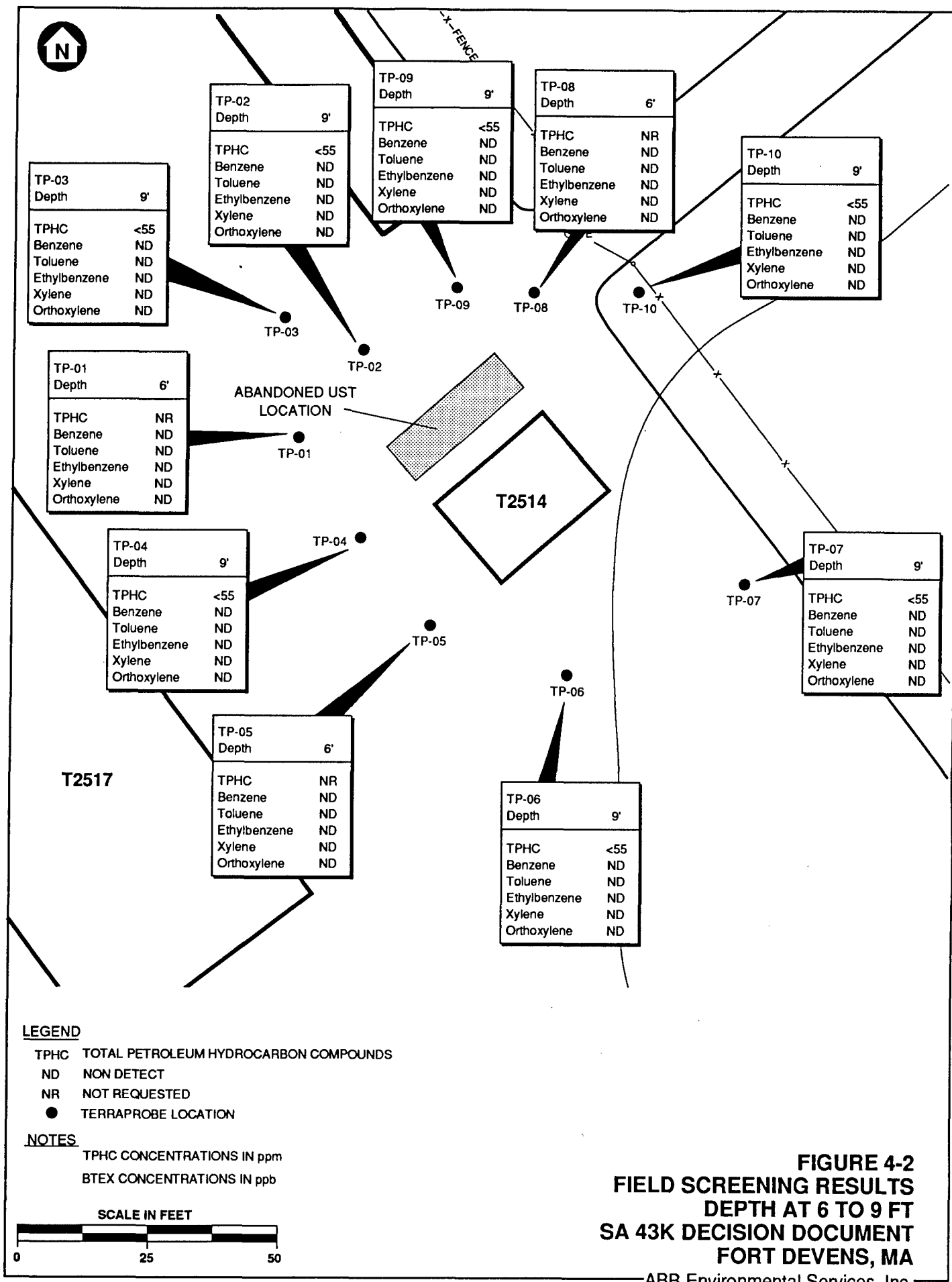


FIGURE 4-2
FIELD SCREENING RESULTS
DEPTH AT 6 TO 9 FT
SA 43K DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

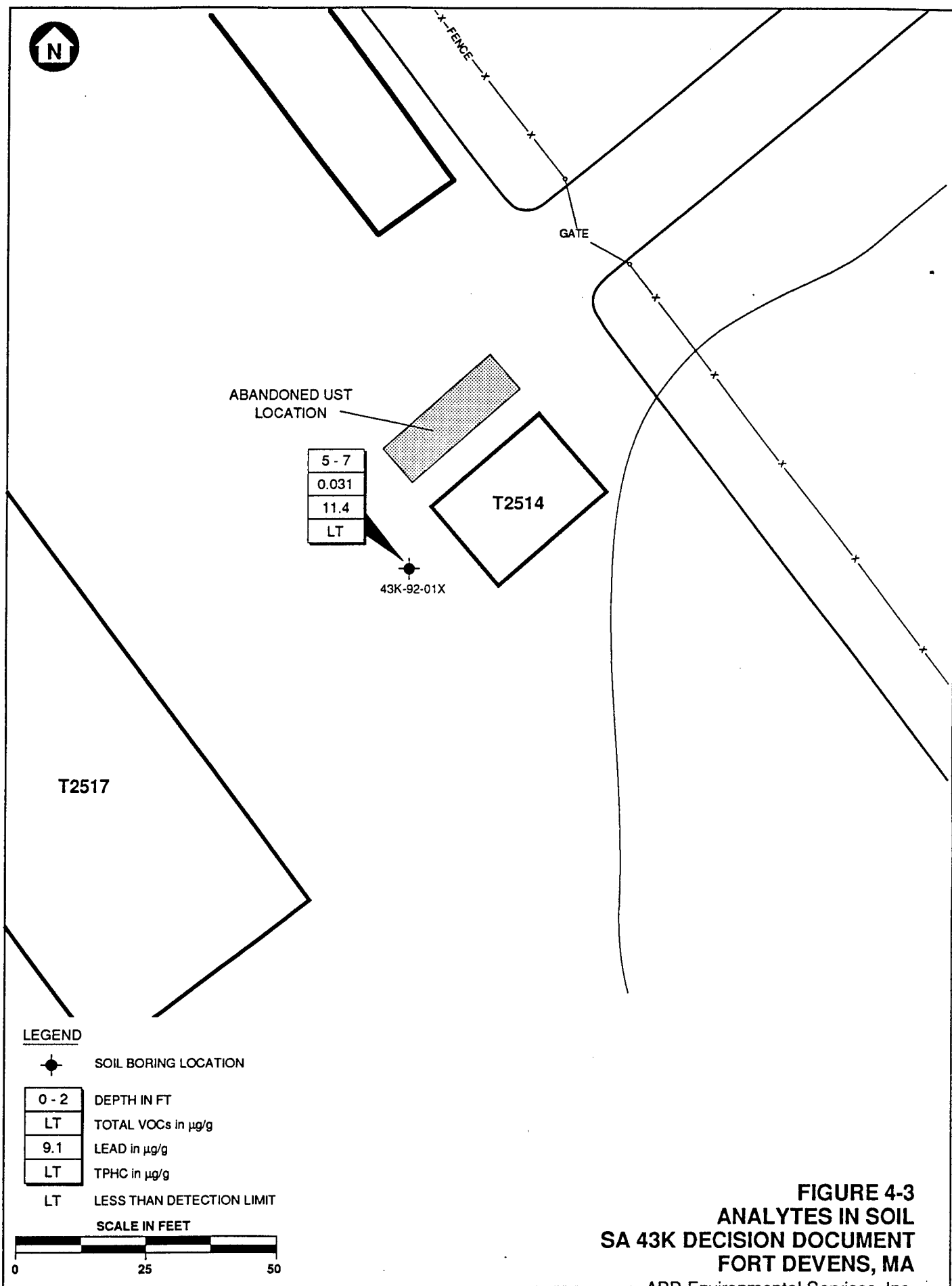


FIGURE 4-3
ANALYTES IN SOIL
SA 43K DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

TABLE 4-1
ATEC/ABB-ES FIELD SCREENING RESULTS
SA 43K - HISTORIC GAS STATIONS

DECISION DOCUMENT
FORT DEVENS

SAMPLE NO.	FIELD SCREENING		LABORATORY	
	PID (ppm)	NDIR (ppm)	VOC (ppm)	TPHC (ppm)
SS-1	5.0	88.7	N/A	N/A
SS-2	30.0	36.2	N/A	N/A
SS-3	0.5	44.7	N/A	N/A
SS-4	5.0	22.1	N/A	N/A
SS-5	50.0	26.9	N/A	N/A
SS-6	190.0	32.5	N/A	N/A
SS-7	60.0	43.4	N/A	N/A
SS-8	50.0	22.2	N/A	N/A
LRS-1	1.0	N/A	N/A	ND
LRS-2	1.3	N/A	N/A	58
LRS-3	4.0	N/A	ND	15
LRS-4	1.1	N/A	N/A	18
LWS-1	N/A	N/A	N/A	22

NOTES:

SS = ATEC FIELD SCREENING SOIL SAMPLE

LRS = POST-REMEDATION LABORATORY SOIL SAMPLE

LWS = ATEC LABORATORY WATER SAMPLE (FROM THE EXCAVATION)

ppm = PARTS PER MILLION

ND = NON-DETECT

N/A = NOT APPLICABLE

PID = PHOTOIONIZATION DETECTOR

NDIR = NON-DISPERSIVE INFRARED

TPHC = TOTAL PETROLEUM HYDROCARBON COMPOUNDS

VOC = VOLATILE ORGANIC COMPOUND

TABLE 4-2
FIELD SCREENING RESULTS
SA 43K - HISTORIC GAS STATIONS

DECISION DOCUMENT
FORT DEVENS

SAMPLE ID	SA #	MEDIUM	SITE ID	DEPTH (feet)	TPHC ppm	TOTAL		TOL* ppb	E-BEN* ppb	M/P XYL** ppb	O-XYL* ppb	COMMENTS
						BTEX	BEN*					
43TSK01XX601XF	43K	SOIL	TP-01	6	NR	0	ND	ND	ND	ND	ND	
43TSK02XX901XF	43K	SOIL	TP-02	9	< 55	0	ND	ND	ND	ND	ND	
43TSK03XX901XF	43K	SOIL	TP-03	9	< 55	0	ND	ND	ND	ND	ND	
43TSK04XX901XF	43K	SOIL	TP-04	9	< 55	0	ND	ND	ND	ND	ND	
43TSK05XX601XF	43K	SOIL	TP-05	6	NR	0	ND	ND	ND	ND	ND	
43TSK06XX901XF	43K	SOIL	TP-06	9	< 55	0	ND	ND	ND	ND	ND	
43TSK07XX901XF	43K	SOIL	TP-07	9	< 55	0	ND	ND	ND	ND	ND	
43TSK08XX601XF	43K	SOIL	TP-08	6	NR	0	ND	ND	ND	ND	ND	
43TSK08XX901XF	43K	SOIL	TP-08	9	< 55	0	ND	ND	ND	ND	ND	
43TSK09XX901XF	43K	SOIL	TP-09	9	< 55	0	ND	ND	ND	ND	ND	*** PHCs Detected
43TSK10XX901XF	43K	SOIL	TP-10	9	< 55	0	ND	ND	ND	ND	ND	

NOTES:

- * = ND denotes a non detect or concentration below 5 ppb
- ** = ND denotes a non detect or concentration below 10 ppb
- *** = Detection of Noncalibrated Petroleum Hydrocarbon Peaks
- # = Study Area
- NR = Not requested
- TPHC = total petroleum hydrocarbon compounds
- BEN = benzene
- TOL = toluene
- PHCs = petroleum hydrocarbons
- TP = TerraProbe
- ND = Not Detected
- E-BEN = ethylbenzene
- M/P XYL = m- and p-xylene isomers
- O XYL = o-xylene isomer

TABLE 4-3
INORGANIC AND ORGANIC COMPOUNDS IN SOIL
SA 43K - HISTORIC GAS STATIONS

DECISION DOCUMENT
FORT DEVENS

ANALYTE	BACK - GROUND	BORING DEPTH	43K-92-01X
ORGANICS (ug/g)			5
ACETONE			
INORGANICS (ug/g)			0.031
LEAD			
OTHER (ug/g)	48.4		11.4
TOTAL ORGANIC CARBON			NA
TOTAL PETROLEUM HYDROCARBONS			< 27.9

NOTES:

TABLE LISTS DETECTED ANALYTES ONLY -

SEE PROJECT ANALYTE LIST FOR SUMMARY

< = LESS THAN DETECTION LIMIT SHOWN

NA = NOT ANALYZED